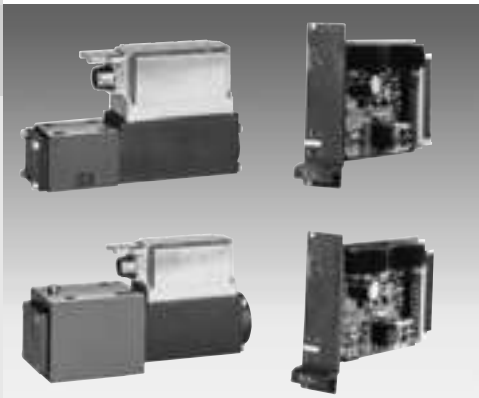
Rexroth
Bosch Group

Servo solenoid valves with electrical position feedback (Lvdt DC/DC) (ruggedized design)

RE 29026/07.08
Replaces: 01.05

Type 4WRPH



Nominal size (NG) 6, 10
Unit series 2X
Maximum working pressure P, A, B 315 bar, T 250 bar
Nominal flow rate 12...40 l/min (NG6), 50...100 l/min (NG10)

List of contents

Contents	Page
Features	1
Ordering data	2
Function, Sectional diagram, Symbols, Accessories	3 and 4
Technical data	5 and 6
Valve with external trigger electronics	7 and 8
Performance curves	9 to 11
Unit dimensions	12 and 13

Features

- Directly operated servo solenoid valve NG6, NG10, with control piston and sleeve in servo quality and sturdy design
- Actuated on one side, 4/4 fail-safe position when switched off
- “Ruggedized” design 40 g with central plug
- Suitable for the wood industry and in systems with difficult ambient conditions
- For subplate attachment, mounting hole configuration NG6 to ISO 4401-03-02-0-05 and NG10 to ISO 4401-05-04-0-05
- Subplates as per catalogue section NG6 RE 45053 and NG10 RE 45055 (order separately)

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Ordering data

4WRP		H			B		–2X/G24	K0/M–750

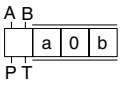
For **external** trigger electronics **= no design.**

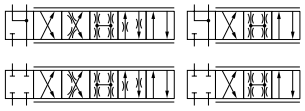
Control piston/sleeve **= H**

Nominal size 6 **= 6**
Nominal size 10 **= 10**

Symbols

4/4-way version





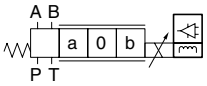
= C3, C5

= C4, C1

With symbols C5 and C1: [3]

P → A: q_v B → T: q_v/2
P → B: q_v/2 A → T: q_v

Side of inductive position transducer



(Standard) **= B**

[1] Only in connection with flow characteristic “p”

[2] Kink 60% for NG6 with nominal flow rate “15” and “25”, otherwise kink 40%

[3] q_v 2:1 only with nominal flow rate ≧ 40 l/min

Nominal flow rate at 70 bar valve pressure difference

Nominal Size 6		Nominal Size 10	
12	= 12 l/min	**50** =	50 l/min
15[1]	= 15 l/min	**100** =	100 l/min
24	= 24 l/min		
25[1]	= 25 l/min		
40	= 40 l/min		

Flow characteristic

L = Linear
P = Non-linear curve [2]

2X = Unit series 20 to 29 (installation and connection dimensions unchanged)

Voltage supply of trigger electronics

G24 = +24 V DC

Electrical connection

K0 = **without** line socket, with plug to DIN 43563-AM6
Order line socket separately

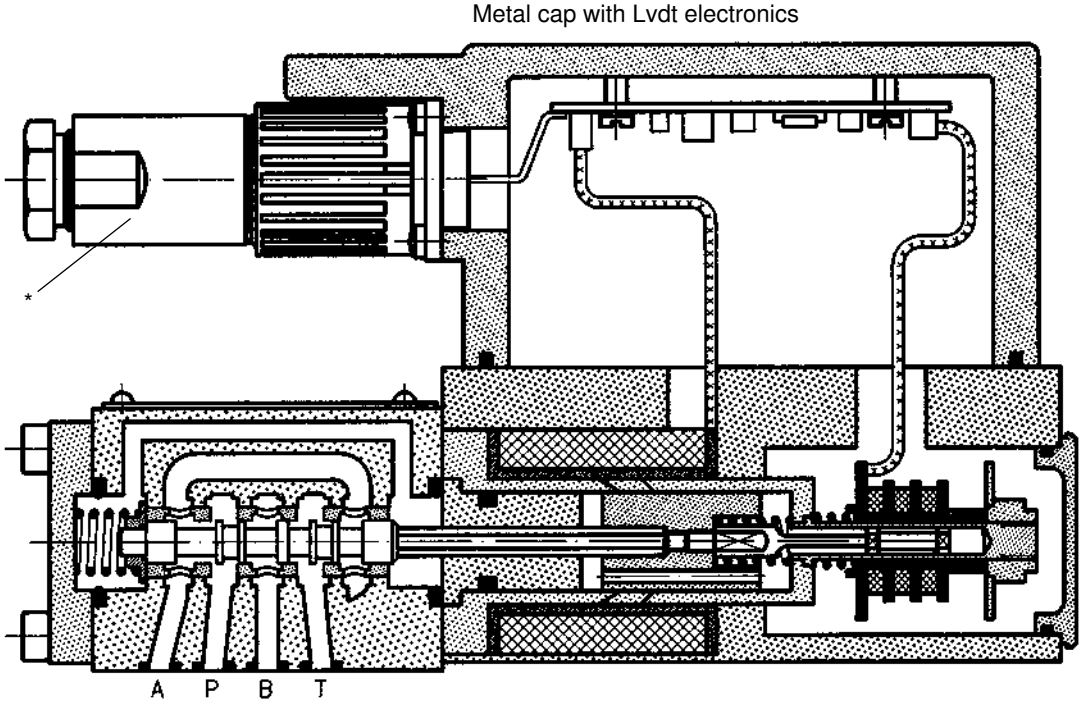
M = NBR seals, suitable for mineral oils (HL, HLP) to DIN 51524

750 = Ruggedized design

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Function, Sectional diagram

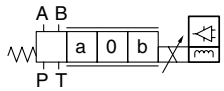
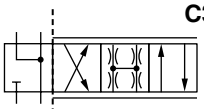
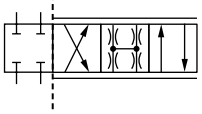
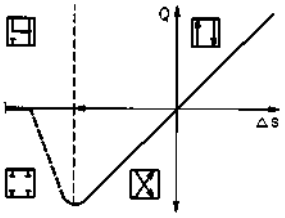
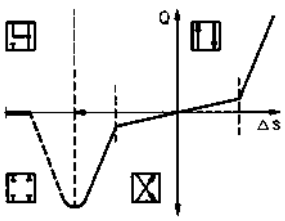
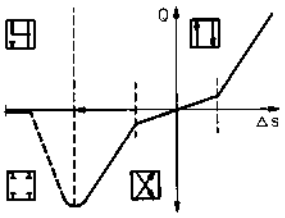
Servo solenoid valve 4WRPH 6...–750



Valve body

Control solenoid with position transducer

Symbols

	Linear	p: kink 60 %	p: kink 40 %
C3, C5  **C4, C1** 			
	C3, C4	C5, C1	C5, C1

Accessories

(4 x) M5 x 30 DIN 912–10.9 	Fastening screws	**2 910 151 166**
	VT-VRRA1-527-20/V0, see RE 30041	**0 811 405 060**
	VT-VRRA1-527-20/V0/K60-AGC, see RE 30040	**0 811 405 066**
	VT-VRRA1-527-20/V0/K40-AGC, see RE 30040	**0 811 405 065**
*  6P + PE (Pg16)	Line socket not included in scope of delivery, see also RE 08008	**1 834 482 024**

Testing and service equipment

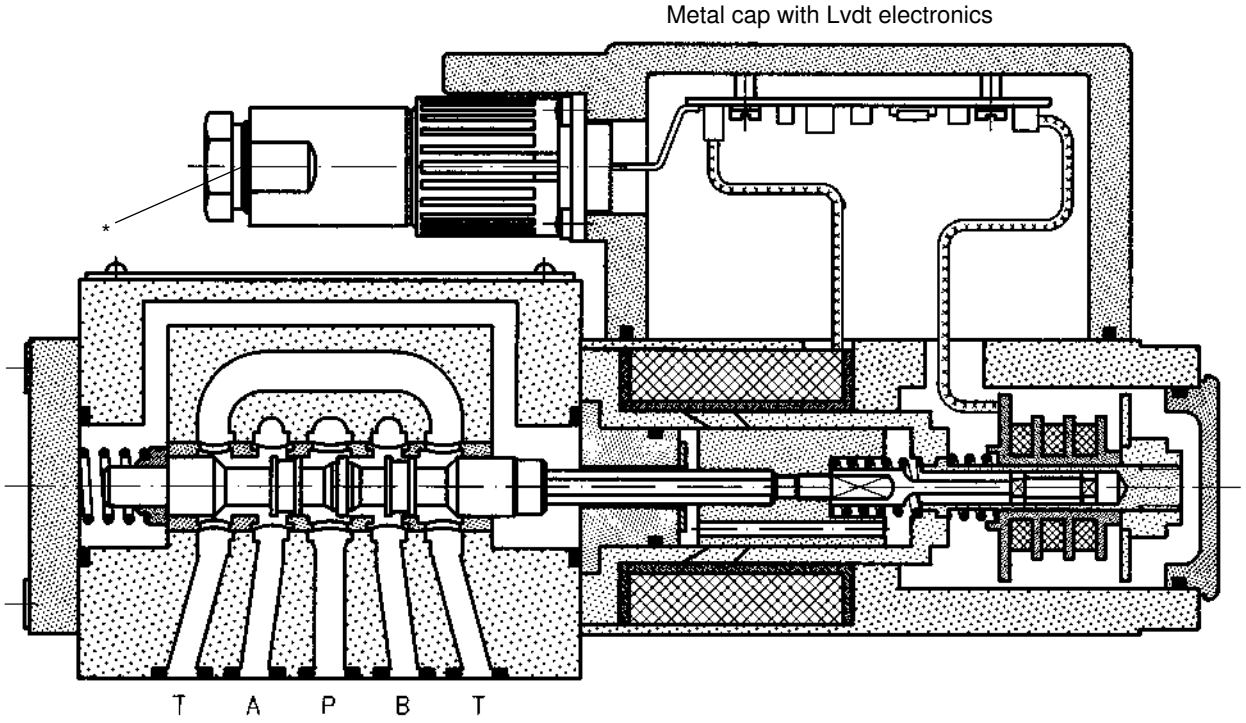
– Test box type VT-PE-TB2, see RE 30064.

– Test adapter type VT-PA-3, see RE 30070.

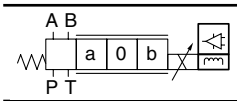
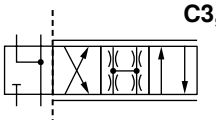
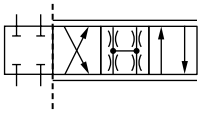
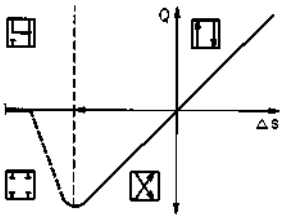
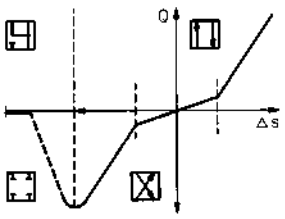
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Function, Sectional diagram

Servo solenoid valve 4WRPH 10...–750



Symbols

	Linear	p: kink 40 %
C3, C5  **C4, C1** 		
	C3, C4	C5, C1

Accessories

(4 x) M6 x 40 DIN 912–10.9 	Fastening screws	**2 910 151 209**
	VT-VRRA1-537-20/V0, see RE 30041	**0 811 405 061**
	VT-VRRA1-537-20/V0/K40-AGC, see RE 30040	**0 811 405 067**
*  6P + PE (Pg16)	Line socket not includes in scope of delivery, see also RE 08008	**1 834 482 024**

Testing and service equipment

– Test box type VT-PE-TB2, see RE 30064.

– Test adapter type VT-PA-3, see RE 30070.

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Technical data (Type 4WRPH 6)

General

Construction		Spool type valve, operated directly, with steel sleeve			
Actuation		Proportional solenoid with position control, external amplifier			
Type of mounting		Subplate, mounting hole configuration NG6 (ISO 4401-03-02-0-05)			
Installation position		Optional			
Ambient temperature range	°C	–20...+60			
Weight	kg	2.5			
Vibration resistance, test condition		Max. 40 g, shaken in 3 dimensions (24 h)			

Hydraulic (measured with HLP 46, ϑ_{oil} = 40 °C ±5 °C)

Pressure fluid			Hydraulic oil to DIN 51524...535, other fluids after prior consultation			
Viscosity range	recommende	mm²/s	20...100			
	max. permitted	mm²/s	10...800			
Pressure fluid temperature range		°C	–20...+70			
Maximum permissible degree of contamination of pressure fluid Purity class to ISO 4406 (c)			Class 18/16/13 [1]			
Flow direction			See symbol			
Nominal flow at Δp = 35 bar per notch [2]		l/min	12	15	24	40
Max. working pressure		bar	Port P, A, B: 315			
Max. pressure		bar	Port T: 250			
Operating limits at Δp Pressure drop at valve		bar	315	315	315	160
Q_{Vnom}: > Q_N valves		bar	315	280	250	100
Leakage at 100 bar		cm³/min	< 300	–	< 500	< 900
		cm³/min	–	< 180	< 300	< 450

Electrical

Cyclic duration factor	%	100	
Power supply		24 V_{nom} (external amplifier)	
Degree of protection		IP 66 to DIN 40050, line socket 1 834 482 024, mounted	
Connectors for solenoid and position transducer		To DIN 43563-AM6 (line socket 1 834 482 024) Pg16 For pin assignment see block diagram on pages 7 and 8	
Max. solenoid current	A	2.7	
Coil resistance R_{20}	Ω	2.5	
Max. power consumption at 100% load and operational temperature	VA	40	
Position transducer DC/DC technology		Supply: +15 V/35 mA –15 V/25 mA	Signal: 0...±10 V (R_L ≧ 10 kΩ)

Static/Dynamic

Hysteresis	%	≦ 0.2
Manufacturing tolerance for Q_{max}	%	< 10
Response time for signal change 0...100%	ms	< 10
Thermal drift		Zero point displacement <1% at ΔT = 40 °C

[1] The purity classes stated for the components must be complied with in hydraulic systems.
Effective filtration prevents problems and also extends the service life of components.
For a selection of filters, see catalogue sections RE 50070, RE 50076 and RE 50081.

[2] Flow rate at a different Δp $\quad Q_x = Q_{nom} \cdot \sqrt{\frac{\Delta p_x}{35}}$

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Technical data (Type 4WRPH 10)

General

Construction		Spool type valve, operated directly, with steel sleeve			
Actuation		Proportional solenoid with position control, external amplifier			
Type of mounting		Subplate, mounting hole configuration NG10 (ISO 4401-05-04-0-05)			
Installation position		Optional			
Ambient temperature range	°C	–20...+60			
Weight	kg	7.0			
Vibration resistance, test condition		Max. 40 g, shaken in 3 dimensions (24 h)			

Hydraulic (measured with HLP 46, ϑ_{oil} = 40 °C ± 5 °C)

Pressure fluid			Hydraulic oil to DIN 51524...535, other fluids after prior consultation			
Viscosity range	recommended	mm²/s	20...100			
	max. permitted	mm²/s	10...800			
Pressure fluid temperature range		°C	–20...+70			
Maximum permissible degree of contamination of pressure fluid Purity class to ISO 4406 (c)			Class 18/16/13 [1]			
Flow direction			See symbol			
Nominal flow at Δp = 35 bar per notch [2]		l/min	50 (1:1)	50 (2:1)	100 (1:1)	100 (2:1)
Max. working pressure		bar	Port P, A, B: 315			
Max. pressure		bar	Port T: 250			
Operating limits at Δp Pressure drop at valve		bar	315	315	160	160
Q_{Vnom}: > Q_N Ventile		bar	250	250	100	100
Leakage at 100 bar		cm³/min	< 1,200	< 1,200	< 1,500	< 1,000
		cm³/min	< 600	< 500	< 600	< 600

Electrical

Cyclic duration factor	%	100	
Power supply		24 V_{nom} (external amplifier)	
Degree of protection		IP 66 to DIN 40050, line socket 1 834 482 024, mounted	
Connectors for solenoid and position transducer		To DIN 43563-AM6 (line socket 1 834 482 024) Pg16 For pin assignment see block diagram on pages 7 and 8	
Max. solenoid current	A	3.7	
Coil resistance R_{20}	Ω	2.4	
Max. power consumption at 100% load and operational temperature	VA	60	
Position transducer DC/DC technology		Supply: +15 V/35 mA –15 V/25 mA	Signal: 0...±10 V (R_L ≧ 10 kΩ)

Static/Dynamic

Hysteresis	%	≦ 0.2
Manufacturing tolerance for Q_{max}	%	< 10
Response time for signal change 0...100%	ms	≦ 25
Thermal drift		Zero point displacement <1% at ΔT = 40 °C

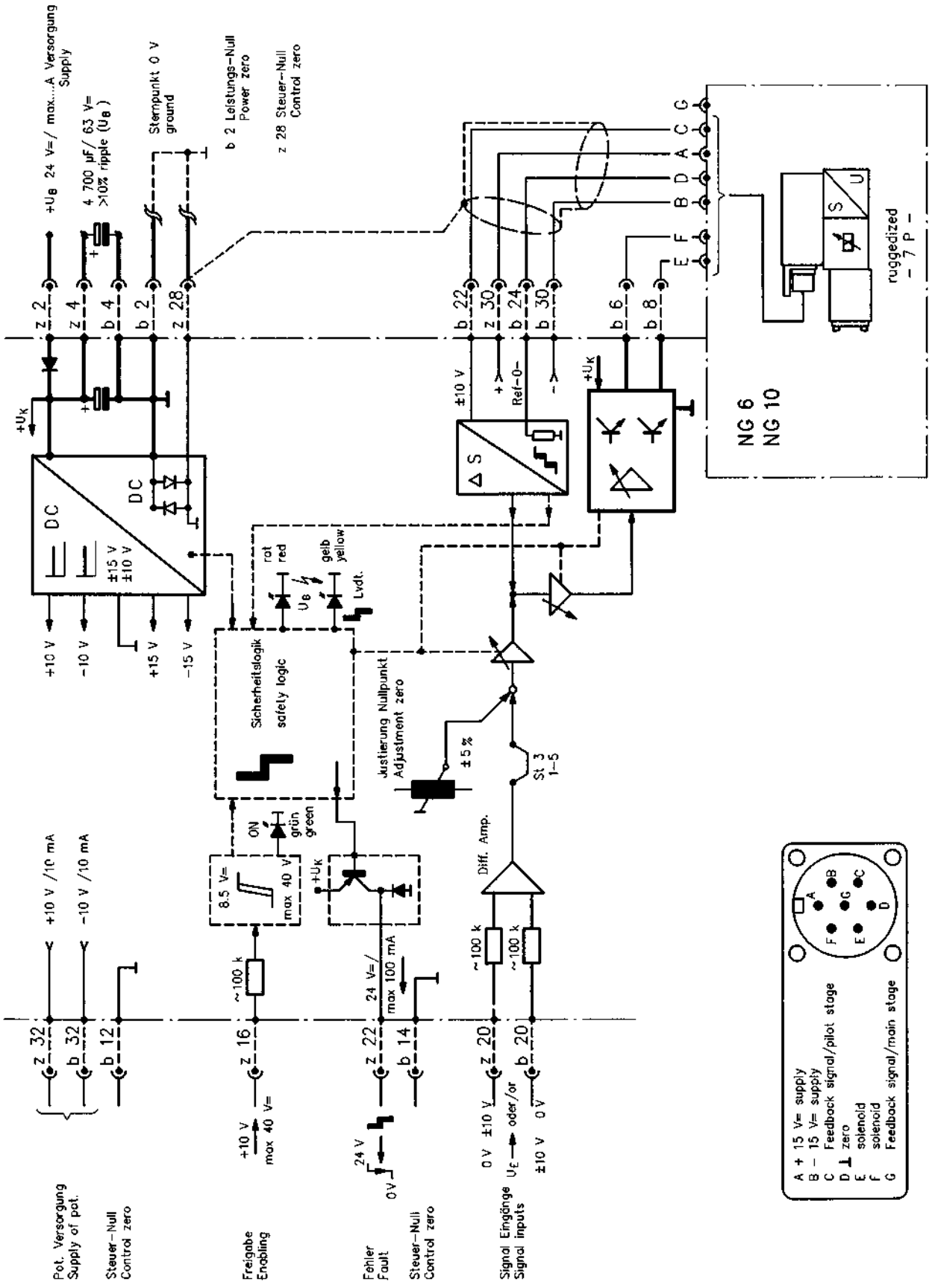
[1] The purity classes stated for the components must be complied with in hydraulic systems.
Effective filtration prevents problems and also extends the service life of components.
For a selection of filters, see catalogue sections RE 50070, RE 50076 and RE 50081.

[2] Flow rate at a different Δp $\quad Q_x = Q_{nom} \cdot \sqrt{\frac{\Delta p_x}{35}}$

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Valve with external trigger electronics (standard linear curve: L)

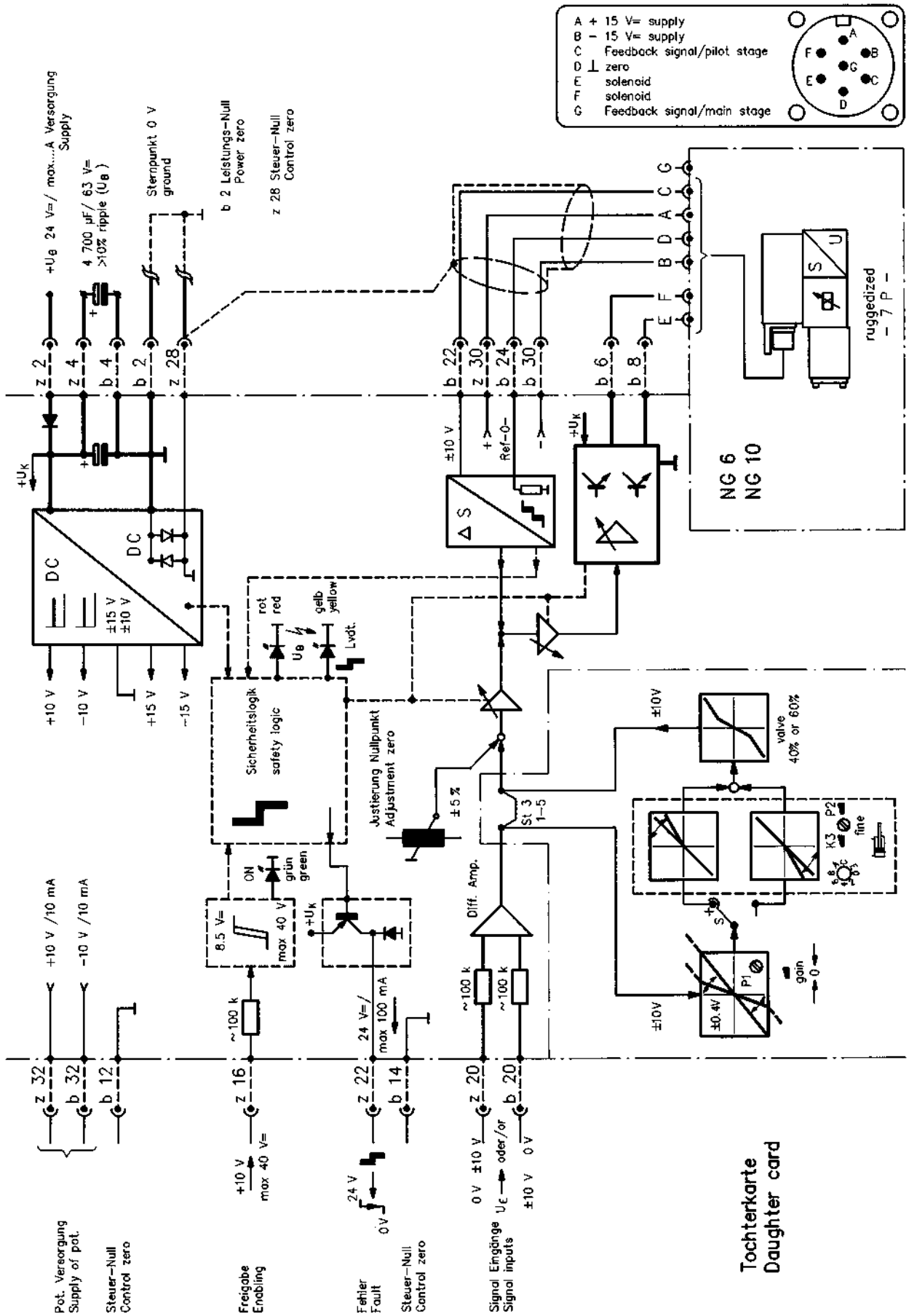
Block diagram/pin assignment



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Valve with external trigger electronics (standard non-linear curve: P)

Block diagram/pin assignment

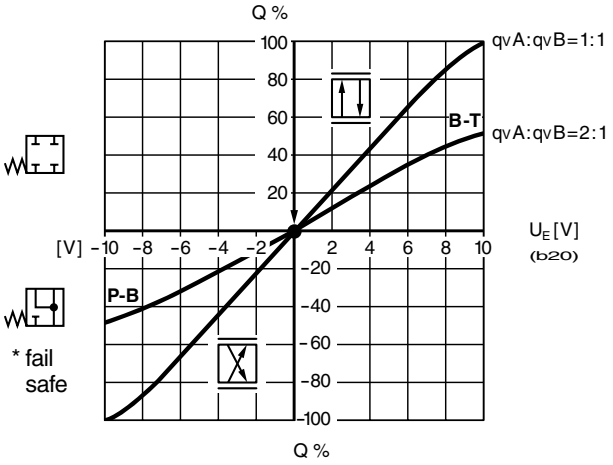


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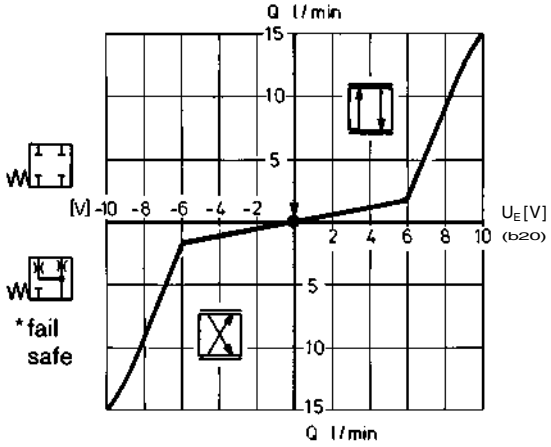
Performance curves (measured with HLP 46, ϑ_{oil} = 40 °C ±5 °C)

Flow rate/Signal function (with 70 bar pressure drop at valve)

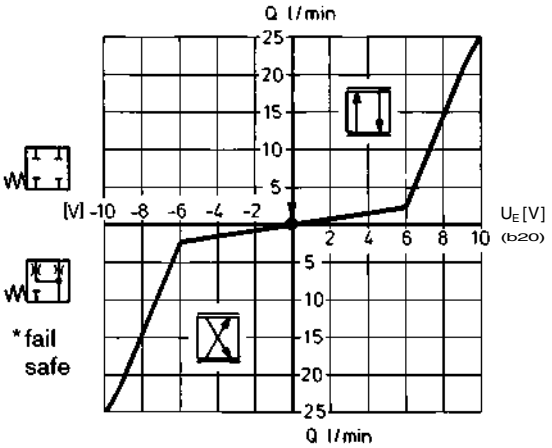
NG6, NG10
L: Linear 1:1 and 2:1



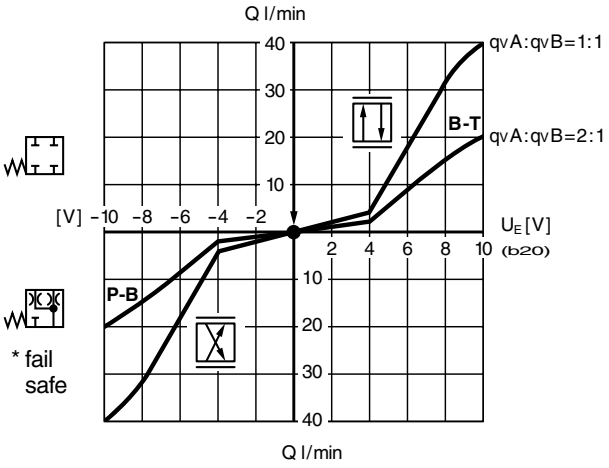
NG6
P: (kink 60%)**



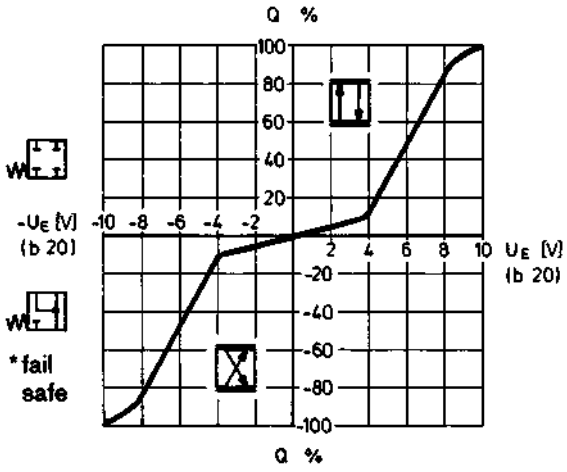
NG6
P: (kink 60%)**



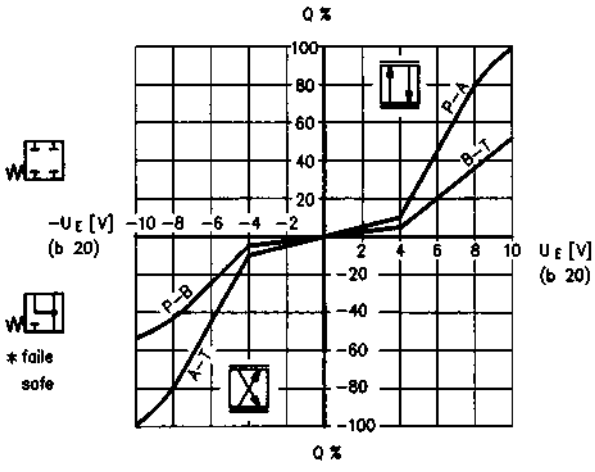
NG6
P: (kink 40%) 1:1 and 2:1**



NG10
P: (kink 40%)**



NG10
P: (kink 40%) 1:1 and 2:1**



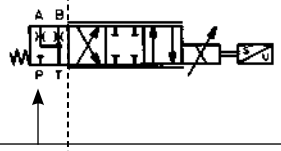
*Fail-safe, when enabling is not released.
**Q-kink = 10% Q_N.

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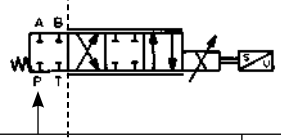
Performance curves (measured with HLP 46, ϑ_{oil} = 40 °C ±5 °C)

Fail-safe position

NG6 ← **Fail-safe position**



Leakage at	100 bar	P–A	50 cm³/min
		P–B	70 cm³/min
Flow at	Δp = 35 bar	A–T	10...20 l/min
		B–T	7...20 l/min

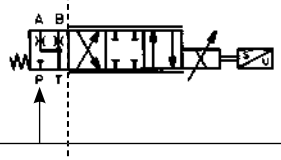


Leakage at	100 bar	P–A	50 cm³/min
		P–B	70 cm³/min
		A–T	70 cm³/min
		B–T	50 cm³/min

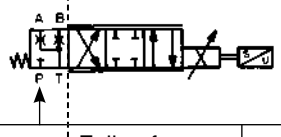


Fail-safe	p = 0 bar → 7 ms	Enable off
	p = 100 bar → 10 ms	

NG10 ← **Fail-safe position**



Leakage at	100 bar	P–A	50 cm³/min
		P–B	70 cm³/min
Flow at	Δp = 35 bar Q_N 50/100 l/min	A–T	10...100 l/min
		B–T	10... 25 l/min

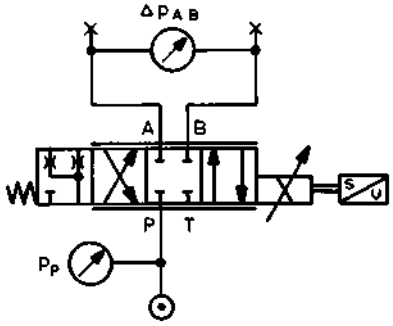


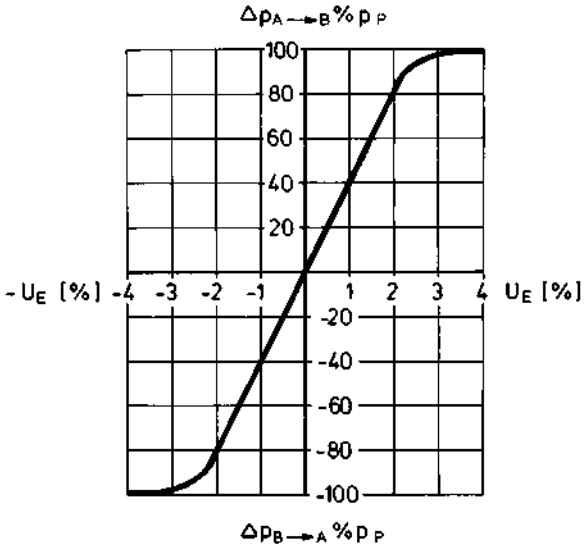
Leakage at	100 bar	P–A	50 cm³/min
		P–B	70 cm³/min
		A–T	70 cm³/min
		B–T	50 cm³/min



Fail-safe	p = 0 bar → 12 ms	Enable off
	p = 100 bar → 16 ms	

Pressure gain



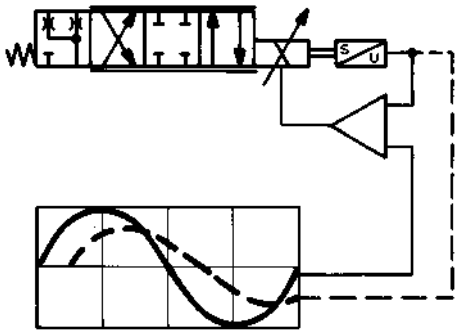


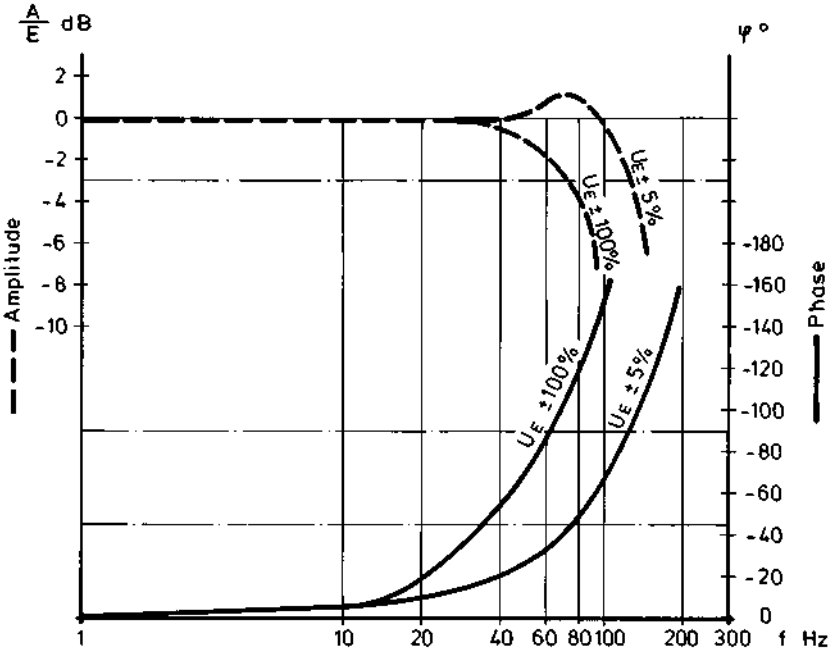
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Performance curves (measured with HLP 46, ϑ_{oil} = 40 °C ±5 °C)

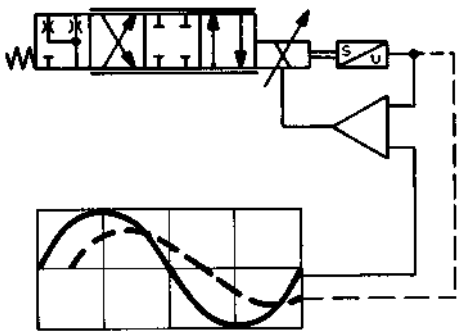
Bode diagram

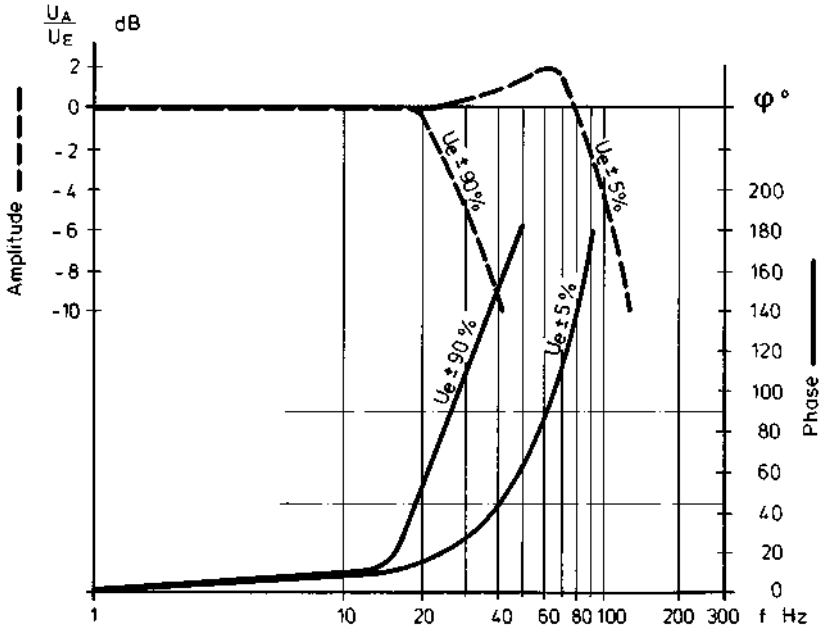
NG6





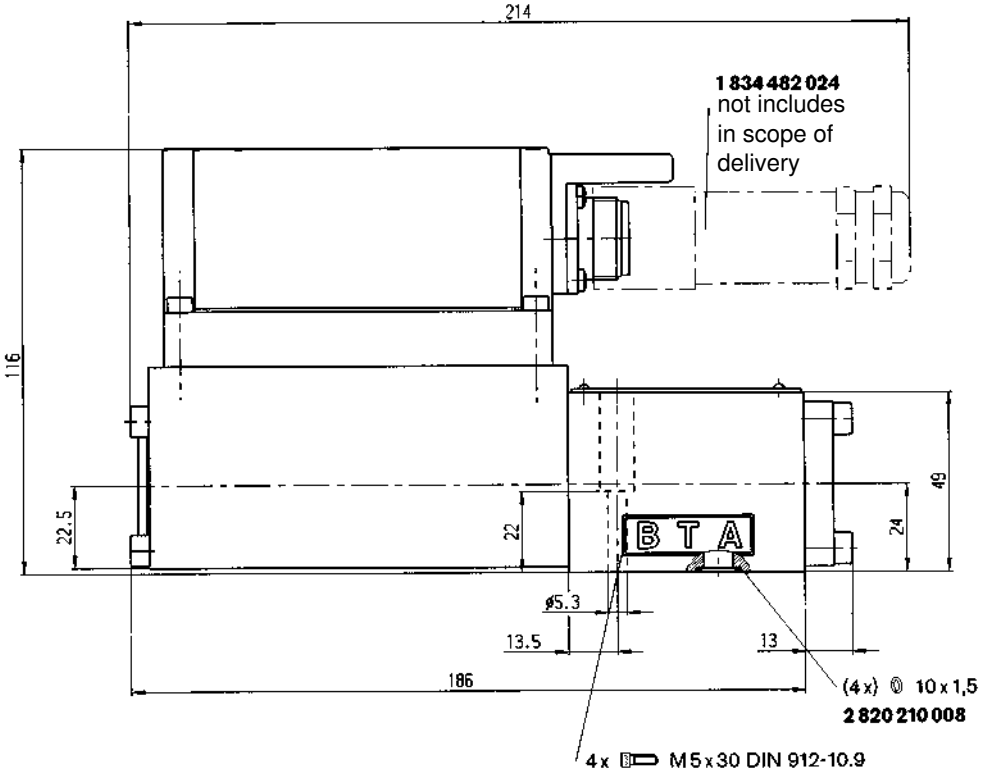
NG10

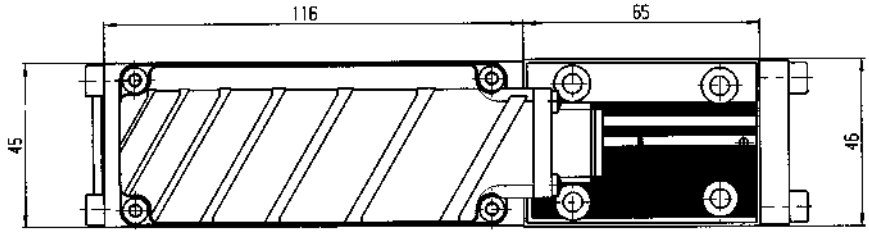




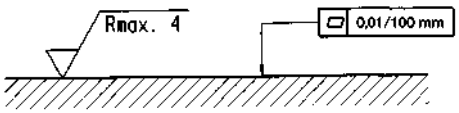
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Unit dimensions for NG6 (in mm)

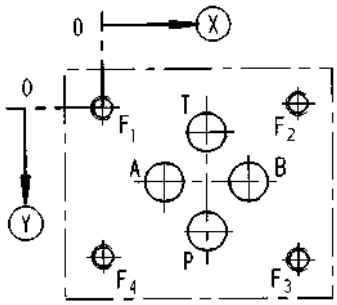




Required surface quality of valve contact surface



Mounting hole configuration: NG6 (ISO 4401-03-02-0-05)
For subplates, see catalogue section RE 45053

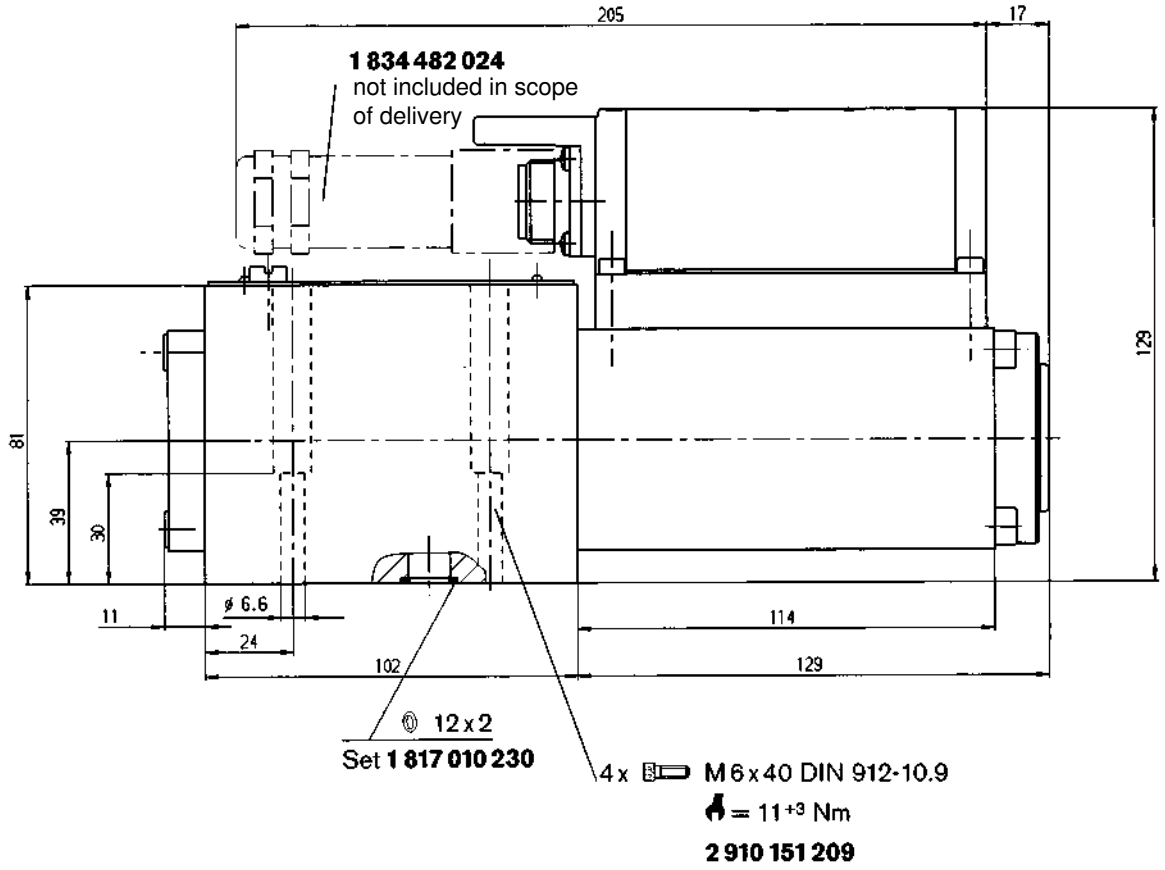


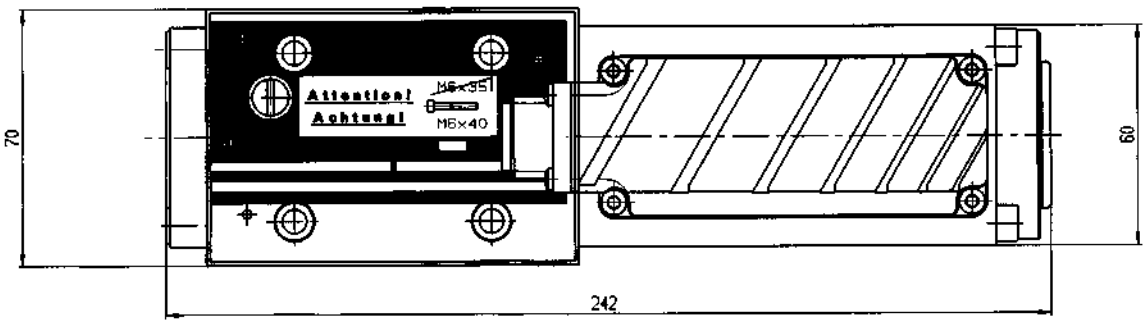
[1] Deviates from standard
[2] Thread depth:
Ferrous metal 1.5 x Ø
Non-ferrous 2 x Ø

	P	A	T	B	F_1	F_2	F_3	F_4
⊗	21.5	12.5	21.5	30.2	0	40.5	40.5	0
Ⓨ	25.9	15.5	5.1	15.5	0	–0.75	31.75	31
∅	8 [1]	8 [1]	8 [1]	8 [1]	M5 [2]	M5 [2]	M5 [2]	M5 [2]

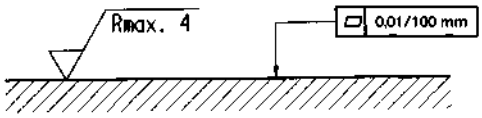
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Unit dimensions for NG10 (in mm)



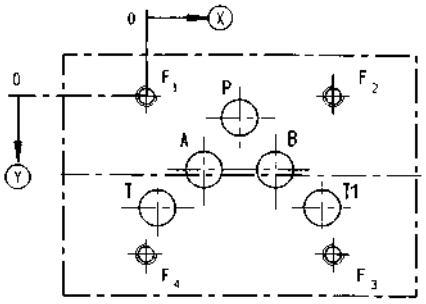


Required surface quality
of valve contact surface



Mounting hole configuration: NG10 (ISO 4401-05-04-0-05)
For subplates, see catalogue section RE 45055

[1] Deviates from standard
[2] Thread depth:
Ferrous metal 1.5 x Ø*
Non-ferrous 2 x Ø
* (NG10 min. 10.5 mm)



	P	A	T	T1	B	F_1	F_2	F_3	F_4
⊗	27	16.7	3.2	50.8	37.3	0	54	54	0
Ⓨ	6.3	21.4	32.5	32.5	21.4	0	0	46	46
∅	10.5 [1]	10.5 [1]	10.5 [1]	10.5 [1]	10.5 [1]	M6 [2]	M6 [2]	M6 [2]	M6 [2]

Notes

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